CLAIMS

1.   A continuous process for the olefin polymerization in a fluidized bed reactor, said process comprising continuously passing a gaseous stream comprising one or more α-olefin monomers through the fluidized bed in the presence of a polymerization catalyst under reactive conditions, withdrawing polymeric product and unreacted fluids from the reactor, cooling part of said unreacted fluids below the dew point to form a two-phase mixture of gas and condensed liquid and reintroducing said two-phase mixture into the reactor, the process being characterized in that:

said two-phase mixture is reintroduced under the distribution plate of the reactor so that a part of condensed liquid is separated from the gas and is successively fed above the fluidized bed through an external pipe connecting the bottom of the reactor to a point situated above the upper limit of the fluidized bed of polymer particles.

2.   The process according to claim 1, wherein said two-phase mixture is reintroduced under the distribution plate along a direction which is tangential to the reactor walls.

3.   The process according to claims 1-2, wherein said part of condensed liquid is separated from the gas by a centrifugal effect.

4.   The process according to claim 1, wherein said part of condensed liquid is separated from the gas by coalescence of liquid droplets and consequent fall by gravity.

5.   The process according to claims 1-4, wherein the separated liquid collects at the bottom of the zone underlying the distribution plate before entering said external pipe.

6.   The process according to claims 1-5, wherein the liquid entering the external pipe is comprised in the range from 20 to 50% by weight of the total condensed liquid.

7.   The process according to claim 6, wherein said liquid flows upward in the external pipe without requiring pumping devices.

8.   The process according to claims 6-7, wherein said liquid is introduced into the fluidized bed reactor at a point situated above the upper limit of the fluidized bed and below the velocity reduction zone.

9.   The process according to claims 6-8, wherein said liquid is sprayed onto the top of said fluidized bed by means of injection devices.

10.   The process according to claims 6-9, wherein said liquid is in an amount comprised from 10 to 20% by weight with respect to the amount of gas entering the external pipe.

11.   The process according to claims 1-10, wherein the diameter of said external pipe is from 0,01 to 0,15 D_R, where D_R is the diameter of the fluidized bed reactor.

12.   The process according to claims 1-11, wherein the remaining part of condensed liquid enters the fluidized bed passing through the distribution plate.

13.   The process according to claim 1, wherein the gaseous stream which is continuously passed through the fluidized bed comprises one or more monomers of formula $CH_2=CHR$, where R is hydrogen or a hydrocarbon radical having 1-12 carbon atoms.

14.   The process according to claim 13, wherein said gaseous stream includes also one or more C4-C8 alkanes or cycloalkanes as inert condensable gases.